

He hoped by this cross to obtain the combination of *wardi* with *ursula*, which does not appear to have been taken wild or bred in captivity. These broods were both unhealthy and were handed over to me in the autumn of 1948 before Dr. Kettlewell went to South Africa. A considerable number of both broods hibernated successfully, but all the members of one brood died before the last change of skin or soon after. The members of the other brood, which was thought to be the better one, changed skin and fed very well at first, but when nearly full grown the majority stopped feeding and remaining motionless gradually dwindled in size and died. Only six pupated and these produced 1 *wardi* ♂ and 5 normal *villica*, 2 ♂♂, 3 ♀♀ in 1949. None was *ursula*. The *wardi* emerged last and was kept for some days in the hope that there were some cocoons amongst the dead leaves and that a female would emerge.

The results prove that *wardi* is recessive to normal *villica* and is determined by a single autosomal gene. The heterozygote is indistinguishable from homozygous normal *villica*. A summary of the results is given below.

- (1) *wardi* ♂ × normal *villica* ♀ from Cranleigh gave all normal *villica*.
- (2) *villica* (heterozygous) × *villica* (heterozygous) gave 1 *wardi* ♂ : 5 normal *villica*, which in so small a brood is not far from the expected ratio of 1:3.
- (3) *wardi* ♂ × *villica* ♀ (presumably heterozygous) from Dovercourt gave 20 *wardi* : 19 normal *villica*, which is as close as possible to the expected ratio of 1:1.
- (4) *wardi* × *wardi* (three small broods) gave *wardi* of both sexes and no normal *villica*.

## Aberrations of *Arctia villica* Linnaeus (Lep. Arctiidae)

By E. A. COCKAYNE, D.M., F.R.C.P.

[The following British aberrations of *Arctia villica* Linnaeus are in the Rothschild-Cockayne-Kettlewell collection in the British Museum.]

*Arctia villica* Linnaeus ab. **aurantior** ab. nov.

The spots on the forewing are brownish orange instead of cream colour; the hindwing is normal.

Type ♀ : Lancing, Sussex, 1916, J. G. S. Bramall. Rothschild coll.

Paratype ♀ : loc. incog. (Harper coll.) Oberthur coll.

*Arctia villica* Linnaeus ab. **posticosuffusa** ab. nov. (Fig. 7).

The black markings of the hindwing have a suffused appearance—their edges are blurred instead of being sharp. The forewing is normal.

Type ♂ : Cranleigh, Surrey, bred vi.1944 by H. B. D. Kettlewell.

Paratype ♂ : Cranleigh, bred 2.vi.1944 by H. B. D. Kettlewell.

*Arctia villica* Linnaeus ab. **infumata** ab. nov. (Fig. 8).

The whole insect is suffused with smoky blackish brown. On the forewing the cream spots are indistinct in outline and dusky; the ground colour of the hindwing is smoky brown with no trace of orange and the black markings are large and indistinct. The cream mark on the thorax is blackish brown and the abdomen is entirely blackish brown.

Type ♂ : loc. incog. T. W. Johnson's collection, 1927. R. Adkin coll. This aberration is quite different from ab. *nigrella* Fettig ab. *brunnescens* Schultz, which has a normal forewing and a brownish hindwing showing the orange colour at the base and inner margin.

*Arctia villica* Linnaeus ab. **flavoabdominalis** ab. nov.

The whole of the abdomen is orange yellow with no trace of the usual deep pink of the distal half.

Type ♀ : Gosport, 1895, J. H. Larcom. (Massey coll.) Cockayne coll.

*Arctia villica* Linnaeus ab. **nigrociliata** ab. nov. (Fig. 9).

The hindwing has a narrow black border and the fringe is black; the forewing is normal.

Type ♂ : Penarth, 1906. R. Adkin coll.

Paratypes 3 ♂ : 1, Folkestone, v.1898, S. G. Hills. Rothschild coll. 1, I. of Wight, bred 1919 by J. Salvage. Rothschild coll. 1, loc. incog. Rothschild coll.

*Arctia villica* Linnaeus ab. **nigrolimbata** ab. nov. (Fig. 10).

There is a broad black band along the margin of the hindwing reaching or almost reaching the anal angle. In the type the fringe is black and in the allotype it is black along the outer half of the wing. The forewing is normal.

Type ♂ : ? Durham, 2.vii.1891. Rothschild coll.

Allotype ♀ : Willesden, London N.W., 1889. (Boot coll.) Cockayne coll.

A female from Breslau is figured by Oberthur (*Lép. Comp.*, 1912, 6, Pl. 109, Fig. 991).

*Arctia villica* Linnaeus ab. **mediodeleta** ab. nov. (Fig. 11).

The median area of the forewing is black; four spots are missing but they are replaced by blackish grey and not by black as intense as that of the ground; there remain only a small cream basal mark and three cream spots in the outer part of the wing.

Type ♂ : loc. incog. (F. Bond, S. Webb, Cosmo Melvill coll.) Cockayne coll.

*Arctia villica* Linnaeus ab. **anomala** ab. nov. (Fig. 12).

The forewing is rather broader and less pointed than usual; the pair of spots at the base are united and form a cream coloured mark broader and longer than normal and a pointed cream mark joined to the anterior part of the basal mark runs outwards close to the costa; the discoidal cream spot is missing, but the spot distal to the discocellular nervure has a pointed extension near the costa which almost reaches the pointed spot attached to the basal spot; there is only one spot near the inner margin instead of two; there are two spots joined together near the termen. This arrangement of spots gives the forewing a most unusual appearance. The hindwing has a black mark near the apex, a black spot near the margin, two black dots in the middle of the wing at the discocellular nervure and a very small dot on the margin representing the wedge shaped mark which is often joined to the apical mark.

Type ♂ : loc. incog. (Baron Bouck coll.) Cockayne coll.